State Maps and Prescriptive Packages

April 2000

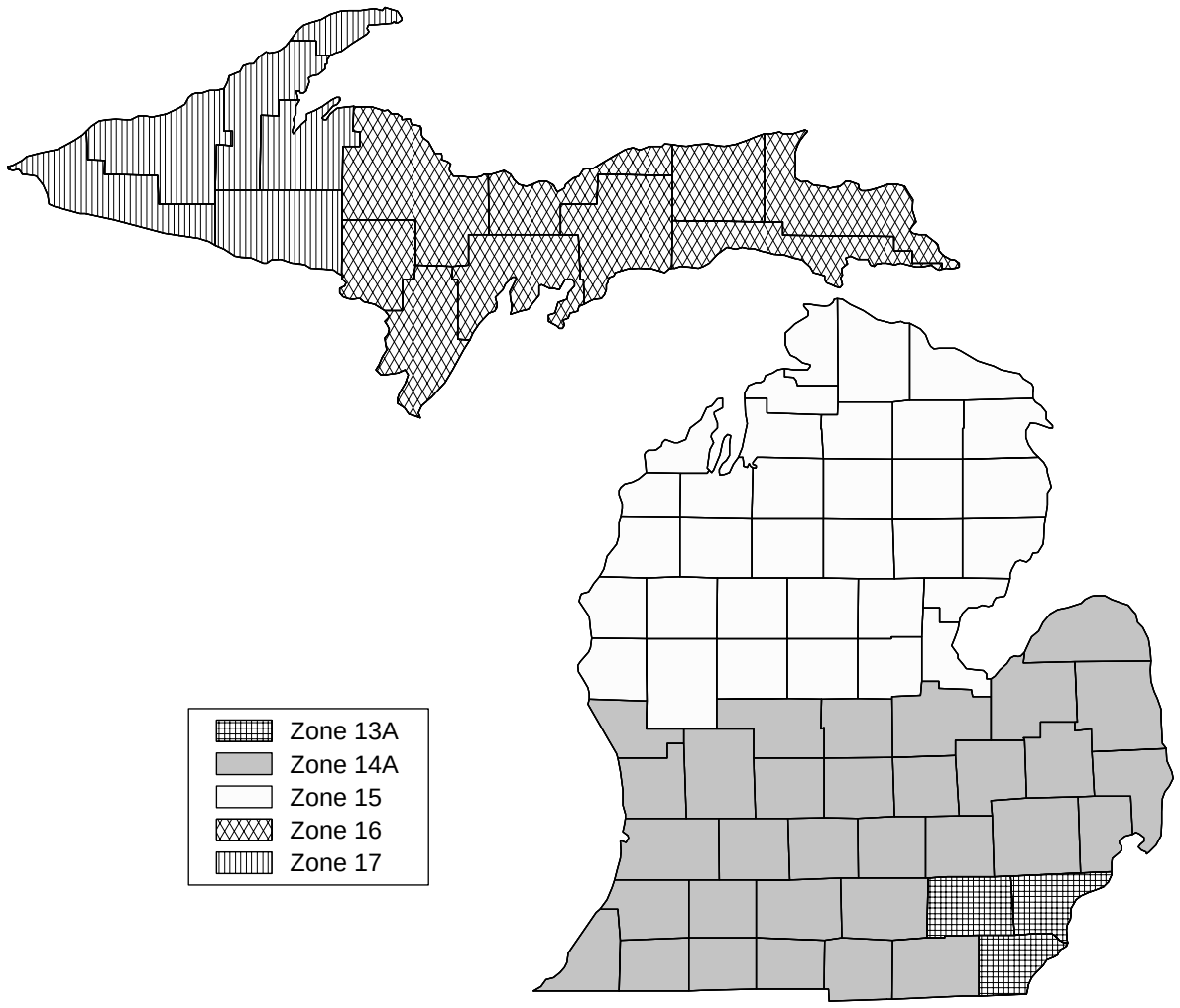
The State Maps and Prescriptive Packages contain supporting materials that are needed when using the Envelope and Mechanical Compliance Guides. Insulation and other building envelope requirements and some mechanical system requirements vary by climate. The State Maps divide the United States into 33 different climate zones at a county level. Zones are numbered from 1 through 19 (consistent with the IECC and MEC*check* climate zones) and have a, b, and c designations to reflect climate differences that affect cooling; e.g., cooling degree days and solar radiation. The climate maps are unchanged from Version 1.

To determine the climate zone to use with your building, locate the map for your state and identify the zone number from the legend or county list.

To determine insulation and other building envelope requirements, find the prescriptive package number corresponding to your climate zone. The *Envelope Compliance Guide* employs a package approach that requires all components in your design to meet or exceed the prescribed efficiency levels contained in the prescriptive package. If you find the prescriptive packages too constraining, consider using the COM*check-EZ* software, which allows tradeoffs among building envelope components.

MICHIGAN

Zone	County	Zone	County
15	Alcona	17	Keweenaw
16	Alger	15	Lake
14A	Allegan	14A	Lapeer
15	Alpena	15	Leelanau
15	Antrim	14A	Lenawee
15	Arenac	14A	Livingston
17	Baraga	16	Luce
14A	Barry	16	Mackinac
15	Bay	14A	Macomb
15	Benzie	15	Manistee
14A	Berrien	16	Marquette
14A	Branch	15	Mason
14A	Calhoun	15	Mecosta
14A	Cass	16	Menominee
15	Charlevoix	15	Midland
15	Cheboygan	15	Missaukee
16	Chippewa	13A	Monroe
15	Clare	14A	Montcalm
14A	Clinton	15	Montmorency
15	Crawford	14A	Muskegon
16	Delta	15	Newaygo
16	Dickinson	14A	Oakland
14A	Eaton	15	Oceana
15	Emmet	15	Ogemaw
14A	Genesee	17	Ontonagon
15	Gladwin	15	Osceola
17	Gogebic	15	Oscoda
15	Grand Traverse	15	Otsego
14A	Gratiot	14A	Ottawa
14A	Hillsdale	15	Presque Isle
17	Houghton	15	Roscommon
14A	Huron	14A	Saginaw
14A	Ingham	14A	Sanilac
14A	Ionia	16	Schoolcraft
15	Iosco	14A	Shiawassee
17	Iron	14A	St Clair
15	Isabella	14A	St Joseph
14A	Jackson	14A	Tuscola
14A	Kalamazoo	14A	Van Buren
15	Kalkaska	13A	Washtenaw
14A	Kent	13A	Wayne
		15	Wexford



COMcheck-EZ™ Prescriptive Packages Climate Zone 13a

Envelope Component	Low Fenestration Area (0-10% Window-Wall Ratio)			Medium Fenestration Area (10%-25% Window-Wall Ratio)			High Fenestration Area (25%-40% Window-Wall Ratio)			Very High Fenestration Area (40%-50% Window-Wall Ratio)		
Walls (a)	No Framing	Metal Framing	Wood Framing	No Framing	Metal Framing	Wood Framing	No Framing	Metal Framing	Wood Framing	No Framing	Metal Framing	Wood Framing
Framed Any Spacing — *Minimum R-Value*	NA	13	11	NA	13	11	NA	13	11	NA	13	11
CMU, 8 in. or greater with Integral Insulation(b) — *Minimum R-Value*	5	11	11	5	11	11	5	11	11	5	11	11
All Other Masonry Walls(c) — *Minimum R-Value*	5	11	11	5	11	11	5	11	11	5	11	11
Windows	No Projection	³.25 Projection	³.5 Projection	No Projection	³.25 Projection	³.5 Projection	No Projection	³.25 Projection	³.5 Projection	No Projection	³.25 Projection	³.5 Projection
Maximum Solar Heat Gain Coefficient	Any	Any	Any	0.6	0.7	Any	0.5	0.6	0.7	0.4	0.5	0.7
Maximum U-Factor	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4
Skylight (Limit 3% of Roof Area)												
Maximum U-Factor		0.8			0.8			0.8			0.8	
Roof	Continuous Insulation	or	Roof Cavity Insulation	Continuous Insulation	or	Roof Cavity Insulation	Continuous Insulation	or	Roof Cavity Insulation	Continuous Insulation	or	Roof Cavity Insulation
All-Wood Joist/Truss — *Minimum R-Value*	14		19	19		25	23		30	23		30
Nonwood Joist/Truss — *Minimum R-Value*	15		19	20		25	24		30	24		30
Concrete Slab or Deck — *Minimum R-Value*	14		NA	19		NA	23		NA	23		NA
Metal Purlin with Thermal Break — *Minimum R-Value*	15		25	20		30	24		X	24		30
Metal Purlin without Thermal Break — *Minimum R-Value*	15		X	20		X	24		X	24		38
Floor	Continuous Insulation	or	Cavity Insulation	Continuous Insulation	or	Cavity Insulation	Continuous Insulation	or	Cavity Insulation	Continuous Insulation	or	Cavity Insulation
All-Wood Joist/Truss — *Minimum R-Value*	16		19	16		19	16		19	16		19
Nonwood Joist/Truss — *Minimum R-Value*	17		25	17		25	17		25	17		25
Concrete Slab or Deck — *Minimum R-Value*	17		NA	17		NA	17		NA	17		NA
Slab Edge or Basement Walls	Insulation			Insulation			Insulation			Insulation		
Minimum R-Value	0			0			8			8		

Notes:

(a) For walls next to unconditioned spaces, use the Low Fenestration Area wall requirements.

(b) Integral insulation in concrete masonry units may be perlite, vermiculite, or other insulating material. Minimum R-values are in addition to insulation in CMU voids.

(c) Use of the Other Masonry Walls category is restricted to walls weighing 35 lb/ft2 or more; lightweight masonry veneers and unfilled CMUs <8 in. in thickness do not qualify.

- "NA" indicates the category is not applicable.
- A minimum R-value of zero indicates no insulation is required.
- "Any" indicates any available product will comply.
- "X" indicates no complying option exists in the prescriptive packages.

COMcheck-EZ™ Prescriptive Packages Climate Zone 14a

Envelope Component	Low Fenestration Area (0-10% Window-Wall Ratio)				Medium Fenestration Area (10%-25% Window-Wall Ratio)				High Fenestration Area (25%-40% Window-Wall Ratio)				Very High Fenestration Area (40%-50% Window-Wall Ratio)			
Walls (a,b)	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing
Framed *Minimum Cavity R-Value (c)*	NA		13	11	NA		13	11	NA		13	11	NA		13	11
Any Spacing *Minimum Continuous R-Value (d)*	NA		3	0	NA		3	0	NA		3	0	NA		3	0
CMU, 8 in. or greater *Minimum Cavity R-Value*	NA		11	11	NA		11	11	NA		11	11	NA		11	11
with Integral Insulation(e) *Minimum Continuous R-Value*	5		0	0	5		0	0	5		0	0	5		0	0
All Other *Minimum Cavity R-Value*	NA		11	11	NA		11	11	NA		11	11	NA		11	11
Masonry Walls(f) *Minimum Continuous R-Value*	5		0	0	5		0	0	5		0	0	5		0	0
Windows	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection
Maximum Solar Heat Gain Coefficient	Any		Any	Any	0.5		0.6	0.7	0.4		0.5	0.6	0.4		0.5	0.6
Maximum U-Factor	0.7		0.7	0.7	0.6		0.6	0.6	0.5		0.5	0.5	0.4		0.4	0.4
Skylight (Limit 3% of Roof Area)																
Maximum U-Factor			0.8				0.8				0.8				0.8	
Roof	Continuous Insulation	or		Roof Cavity Insulation	Continuous Insulation	or		Roof Cavity Insulation	Continuous Insulation	or		Roof Cavity Insulation	Continuous Insulation	or		Roof Cavity Insulation
All-Wood Joist/Truss *Minimum R-Value*	17			19	19			25	23			30	23			30
Nonwood Joist/Truss *Minimum R-Value*	18			25	20			25	24			30	24			30
Concrete Slab or Deck *Minimum R-Value*	17			NA	19			NA	23			NA	23			NA
Metal Purlin with Thermal Break *Minimum R-Value*	18			30	20			30	24			X	24			38
Metal Purlin without Thermal Break *Minimum R-Value*	18			X	20			X	24			X	24			38
Floor	Continuous Insulation	or		Cavity Insulation	Continuous Insulation	or		Cavity Insulation	Continuous Insulation	or		Cavity Insulation	Continuous Insulation	or		Cavity Insulation
All-Wood Joist/Truss *Minimum R-Value*	18			25	18			25	18			25	18			25
Nonwood Joist/Truss *Minimum R-Value*	19			25	19			25	19			25	19			25
Concrete Slab or Deck *Minimum R-Value*	19			NA	19			NA	19			NA	19			NA
Slab Edge or Basement Walls	Insulation				Insulation				Insulation				Insulation			
Minimum R-Value	0				8				8				8			

Notes:

(a) For walls next to unconditioned spaces, use the Low Fenestration Area wall requirements.

(b) Where values are shown for both cavity and continuous insulation, both requirements must be met.

(c) Cavity insulation is insulation between framing members or furring strips and does not refer to integral insulation in CMUs.

(d) Continuous insulation is insulation that is continuous across structural members, and its effectiveness is undimished by compression or bridging.

(e) Integral insulation in concrete masonry units may be perlite, vermiculite, or other insulating material. Minimum R-values are in addition to insulation in CMU voids.

(f) Use of the Other Masonry Walls category is restricted to walls weighing 35 lb/ft2 or more; lightweight masonry veneers and unfilled CMUs <8 in. in thickness do not qualify.

- "NA" indicates the category is not applicable.
- A minimum R-value of zero indicates no insulation is required.
- "Any" indicates any available product will comply.
- "X" indicates no complying option exists in the prescriptive packages.

COMcheck-EZ™ Prescriptive Packages Climate Zone 15

Envelope Component	Low Fenestration Area (0-10% Window-Wall Ratio)				Medium Fenestration Area (10%-25% Window-Wall Ratio)				High Fenestration Area (25%-40% Window-Wall Ratio)				Very High Fenestration Area (40%-50% Window-Wall Ratio)			
Walls (a,b)	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing
Framed *Minimum Cavity R-Value (c)*	NA		13	11	NA		13	11	NA		13	11	NA		13	13
Any Spacing *Minimum Continuous R-Value (d)*	NA		3	0	NA		3	0	NA		3	0	NA		7	4
CMU, 8 in. or greater *Minimum Cavity R-Value*	NA		11	11	NA		11	11	NA		11	11	NA		13	11
with Integral Insulation(e) *Minimum Continuous R-Value*	5		0	0	5		0	0	5		0	0	5		0	0
All Other *Minimum Cavity R-Value*	NA		11	11	NA		11	11	NA		13	11	NA		13	11
Masonry Walls(f) *Minimum Continuous R-Value*	5		0	0	5		0	0	6		0	0	6		3	0
Windows	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection
Maximum Solar Heat Gain Coefficient	Any		Any	Any	0.5		0.6	0.7	0.5		0.6	0.7	0.4		0.5	0.7
Maximum U-Factor	0.7		0.7	0.7	0.5		0.5	0.5	0.4		0.4	0.4	0.4		0.4	0.4
Skylight (Limit 3% of Roof Area)																
Maximum U-Factor	0.6				0.6				0.6				0.6			
Roof	Continuous Insulation	or	Roof Cavity Insulation		Continuous Insulation	or	Roof Cavity Insulation		Continuous Insulation	or	Roof Cavity Insulation		Continuous Insulation	or	Roof Cavity Insulation	
All-Wood Joist/Truss *Minimum R-Value*	19		25		19		25		23		30		23		30	
Nonwood Joist/Truss *Minimum R-Value*	20		25		20		25		24		30		24		30	
Concrete Slab or Deck *Minimum R-Value*	19		NA		19		NA		23		NA		23		NA	
Metal Purlin with Thermal Break *Minimum R-Value*	20		30		20		30		24		X		24		38	
Metal Purlin without Thermal Break *Minimum R-Value*	20		X		20		X		24		X		24		NA	
Floor	Continuous Insulation	or	Cavity Insulation		Continuous Insulation	or	Cavity Insulation		Continuous Insulation	or	Cavity Insulation		Continuous Insulation	or	Cavity Insulation	
All-Wood Joist/Truss *Minimum R-Value*	22		25		22		25		22		25		22		25	
Nonwood Joist/Truss *Minimum R-Value*	23		30		23		30		23		30		23		30	
Concrete Slab or Deck *Minimum R-Value*	22		NA		22		NA		22		NA		22		NA	
Slab Edge or Basement Walls	Insulation				Insulation				Insulation				Insulation			
Minimum R-Value	0				8				8				8			

Notes:

(a) For walls next to unconditioned spaces, use the Low Fenestration Area wall requirements.

(b) Where values are shown for both cavity and continuous insulation, both requirements must be met.

(c) Cavity insulation is insulation between framing members or furring strips and does not refer to integral insulation in CMUs.

(d) Continuous insulation is insulation that is continuous across structural members, and its effectiveness is undimished by compression or bridging.

(e) Integral insulation in concrete masonry units may be perlite, vermiculite, or other insulating material. Minimum R-values are in addition to insulation in CMU voids.

(f) Use of the Other Masonry Walls category is restricted to walls weighing 35 lb/ft2 or more; lightweight masonry veneers and unfilled CMUs <8 in. in thickness do not qualify.

- "NA" indicates the category is not applicable.
- A minimum R-value of zero indicates no insulation is required.
- "Any" indicates any available product will comply.
- "X" indicates no complying option exists in the prescriptive packages.

COMcheck-EZ™ Prescriptive Packages Climate Zone 16

Envelope Component	Low Fenestration Area (0-10% Window-Wall Ratio)			Medium Fenestration Area (10%-25% Window-Wall Ratio)			High Fenestration Area (25%-40% Window-Wall Ratio)			Very High Fenestration Area (40%-50% Window-Wall Ratio)		
Walls (a,b)	No Framing	Metal Framing	Wood Framing	No Framing	Metal Framing	Wood Framing	No Framing	Metal Framing	Wood Framing	No Framing	Metal Framing	Wood Framing
Framed *Minimum Cavity R-Value (c)*	NA	13	11	NA	13	11	NA	13	13	NA	13	13
Any Spacing *Minimum Continuous R-Value (d)*	NA	3	0	NA	3	0	NA	3	0	NA	14	7
CMU, 8 in. or greater *Minimum Cavity R-Value*	NA	11	11	NA	11	11	NA	13	11	NA	13	13
with Integral Insulation(e) *Minimum Continuous R-Value*	5	0	0	5	0	0	6	0	0	10	3	0
All Other *Minimum Cavity R-Value*	NA	11	11	NA	13	11	NA	13	13	NA	13	13
Masonry Walls(f) *Minimum Continuous R-Value*	5	0	0	9	3	0	9	3	0	9	3	3
Windows	No Projection	[3].25 Projection	[3].5 Projection	No Projection	[3].25 Projection	[3].5 Projection	No Projection	[3].25 Projection	[3].5 Projection	No Projection	[3].25 Projection	[3].5 Projection
Maximum Solar Heat Gain Coefficient	0.7	Any	Any	0.7	Any	Any	0.5	0.6	0.7	0.4	0.5	0.7
Maximum U-Factor	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Skylight (Limit 3% of Roof Area)												
Maximum U-Factor		0.6			0.6			0.6			0.6	
Roof	Continuous Insulation	or	Roof Cavity Insulation	Continuous Insulation	or	Roof Cavity Insulation	Continuous Insulation	or	Roof Cavity Insulation	Continuous Insulation	or	Roof Cavity Insulation
All-Wood Joist/Truss *Minimum R-Value*	19		25	23		30	23		30	23		30
Nonwood Joist/Truss *Minimum R-Value*	20		25	24		30	24		30	24		30
Concrete Slab or Deck *Minimum R-Value*	19		NA	23		NA	23		NA	23		NA
Metal Purlin with Thermal Break *Minimum R-Value*	20		30	24		X	24		X	24		38
Metal Purlin without Thermal Break *Minimum R-Value*	20		X	24		X	24		X	24		NA
Floor	Continuous Insulation	or	Cavity Insulation	Continuous Insulation	or	Cavity Insulation	Continuous Insulation	or	Cavity Insulation	Continuous Insulation	or	Cavity Insulation
All-Wood Joist/Truss *Minimum R-Value*	22		25	22		25	22		25	22		25
Nonwood Joist/Truss *Minimum R-Value*	23		30	23		30	23		30	23		30
Concrete Slab or Deck *Minimum R-Value*	22		NA	22		NA	22		NA	22		NA
Slab Edge or Basement Walls	Insulation			Insulation			Insulation			Insulation		
Minimum R-Value	8			8			8			8		

Notes:

(a) For walls next to unconditioned spaces, use the Low Fenestration Area wall requirements.

(b) Where values are shown for both cavity and continuous insulation, both requirements must be met.

(c) Cavity insulation is insulation between framing members or furring strips and does not refer to integral insulation in CMUs.

(d) Continuous insulation is insulation that is continuous across structural members, and its effectiveness is undimished by compression or bridging.

(e) Integral insulation in concrete masonry units may be perlite, vermiculite, or other insulating material. Minimum R-values are in addition to insulation in CMU voids.

(f) Use of the Other Masonry Walls category is restricted to walls weighing 35 lb/ft2 or more; lightweight masonry veneers and unfilled CMUs <8 in. in thickness do not qualify.

- "NA" indicates the category is not applicable.
- A minimum R-value of zero indicates no insulation is required.
- "Any" indicates any available product will comply.
- "X" indicates no complying option exists in the prescriptive packages.

COMcheck-EZ™ Prescriptive Packages Climate Zone 17

Envelope Component	Low Fenestration Area (0-10% Window-Wall Ratio)				Medium Fenestration Area (10%-25% Window-Wall Ratio)				High Fenestration Area (25%-40% Window-Wall Ratio)				Very High Fenestration Area (40%-50% Window-Wall Ratio)			
Walls (a,b)	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing	No Framing	or	Metal Framing	or Wood Framing
Framed *Minimum Cavity R-Value (c)*	NA		13	13	NA		13	13	NA		13	13	NA		13	13
Any Spacing *Minimum Continuous R-Value (d)*	NA		3	0	NA		3	0	NA		4	3	NA		14	14
CMU, 8 in. or greater *Minimum Cavity R-Value*	NA		13	11	NA		13	11	NA		13	13	NA		13	13
with Integral Insulation(e) *Minimum Continuous R-Value*	6		0	0	6		0	0	10		4	3	14		10	7
All Other *Minimum Cavity R-Value*	NA		13	11	NA		13	13	NA		13	13	NA		13	13
Masonry Walls(f) *Minimum Continuous R-Value*	6		0	0	9		3	0	10		4	3	14		10	7
Windows	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection	No Projection		[3].25 Projection	[3].5 Projection
Maximum Solar Heat Gain Coefficient	0.7		Any	Any	0.7		Any	Any	0.7(g)		Any(g)	Any(g)	0.4		0.5	0.7
Maximum U-Factor	0.5		0.5	0.5	0.4		0.4	0.4	0.4		0.4	0.4	0.4		0.4	0.4
Skylight (Limit 3% of Roof Area)																
Maximum U-Factor			0.6				0.6				0.6				0.6	
Roof	Continuous Insulation	or	Roof Cavity Insulation		Continuous Insulation	or	Roof Cavity Insulation		Continuous Insulation	or	Roof Cavity Insulation		Continuous Insulation	or	Roof Cavity Insulation	
All-Wood Joist/Truss *Minimum R-Value*	23		30		23		30		23		30		23		30	
Nonwood Joist/Truss *Minimum R-Value*	24		30		24		30		24		30		24		30	
Concrete Slab or Deck *Minimum R-Value*	23		NA		23		NA		23		NA		23		NA	
Metal Purlin with Thermal Break *Minimum R-Value*	24		X		24		X		24		X		24		38	
Metal Purlin without Thermal Break *Minimum R-Value*	24		X		24		X		24		X		24		NA	
Floor	Continuous Insulation	or	Cavity Insulation		Continuous Insulation	or	Cavity Insulation		Continuous Insulation	or	Cavity Insulation		Continuous Insulation	or	Cavity Insulation	
All-Wood Joist/Truss *Minimum R-Value*	22		25		22		25		22		25		22		25	
Nonwood Joist/Truss *Minimum R-Value*	23		30		23		30		23		30		23		30	
Concrete Slab or Deck *Minimum R-Value*	22		NA		22		NA		22		NA		22		NA	
Slab Edge or Basement Walls	Insulation				Insulation				Insulation				Insulation			
Minimum R-Value	8				8				8				8			

Notes:

(a) For walls next to unconditioned spaces, use the Low Fenestration Area wall requirements.

(b) Where values are shown for both cavity and continuous insulation, both requirements must be met.

(c) Cavity insulation is insulation between framing members or furring strips and does not refer to integral insulation in CMUs.

(d) Continuous insulation is insulation that is continuous across structural members, and its effectiveness is undimished by compression or bridging.

(e) Integral insulation in concrete masonry units may be perlite, vermiculite, or other insulating material. Minimum R-values are in addition to insulation in CMU voids.

(f) Use of the Other Masonry Walls category is restricted to walls weighing 35 lb/ft2 or more; lightweight masonry veneers and unfilled CMUs <8 in. in thickness do not qualify.

(g) For buildings over 3 stories in height, the maximum SHGC shall be 0.60.

- "NA" indicates the category is not applicable.
- A minimum R-value of zero indicates no insulation is required.
- "Any" indicates any available product will comply.
- "X" indicates no complying option exists in the prescriptive packages.